

168673

**SEARCH REQUEST FORM** Scientific and Technical Information Center - EIC2800  
Rev. 3/15/2004 This is an experimental format -- Please give suggestions or comments to Jeff Harrison, JEF-4B68, 272-2511.

Date 10/14/05 Serial # 09/805,027 Priority Application Date \_\_\_\_\_  
Your Name M. Hennis Examiner # \_\_\_\_\_  
AU 2822 Phone 292-1838 Room JEF-5A30  
In what format would you like your results? Paper is the default. PAPER DISK EMAIL

If submitting more than one search, please prioritize in order of need.

The EIC searcher normally will contact you before beginning a prior art search. If you would like to sit with a searcher for an interactive search, please notify one of the searchers.

Where have you searched so far on this case?

Circle: USPT DWPI EPO Abs JPO Abs IBM TDB

Other: \_\_\_\_\_

What relevant art have you found so far? Please attach pertinent citations or Information Disclosure Statements.

What types of references would you like? Please checkmark:

Primary Refs \_\_\_\_\_ Nonpatent Literature \_\_\_\_\_ Other \_\_\_\_\_  
Secondary Refs \_\_\_\_\_ Foreign Patents \_\_\_\_\_  
Teaching Refs \_\_\_\_\_

What is the topic, such as the novelty, motivation, utility, or other specific facets defining the desired focus of this search? Please include the concepts, synonyms, keywords, acronyms, registry numbers, definitions, structures, strategies, and anything else that helps to describe the topic. Please attach a copy of the abstract and pertinent claims.

Claims 1-3, 5-7, 9 & 10

Problem: See pages 2-5  
Solution: " " " " " "

US 5,525,707

6,531,389

5,930,669

Claims 7/11/05

Searcher Mary Mims  
Searcher Phone: 25928  
Searcher Location: NYC-BICANCO, JEF-4B68  
Date Searcher Picked Up: 10/19/05  
Date Completed: 10/21/05  
Searcher Prep/Rev Time: 660  
Online Time: 180

Type of Search  
Structure (H) \_\_\_\_\_  
Bibliography \_\_\_\_\_  
Litigation \_\_\_\_\_  
Fulltext \_\_\_\_\_  
Patent Family \_\_\_\_\_  
Other \_\_\_\_\_

Vendor  
STN ☒ \_\_\_\_\_  
Dinley \_\_\_\_\_  
Questel/Orbit \_\_\_\_\_  
Lexis-Nexis \_\_\_\_\_  
WWW/Internet ☒ \_\_\_\_\_  
Other \_\_\_\_\_

09/805,027

searched on 10/24/2005

FILE 'HCAPLUS' ENTERED AT 08:26:59 ON 24 OCT 2005  
E US 5930669/RE  
L1 15 SEA ABB=ON PLU=ON "US 5930669, 1999, UZOH"/RE  
  
FILE 'STNGUIDE' ENTERED AT 08:27:12 ON 24 OCT 2005  
  
FILE 'HCAPLUS' ENTERED AT 08:27:40 ON 24 OCT 2005  
E JP10284603/RE  
  
FILE 'HCAPLUS' ENTERED AT 08:27:46 ON 24 OCT 2005  
E JP 10284603/RE  
  
FILE 'STNGUIDE' ENTERED AT 08:27:52 ON 24 OCT 2005  
  
FILE 'HCAPLUS' ENTERED AT 08:28:15 ON 24 OCT 2005  
E US6429519/RE  
  
FILE 'HCAPLUS' ENTERED AT 08:28:20 ON 24 OCT 2005  
E US 6429519/RE  
  
FILE 'STNGUIDE' ENTERED AT 08:28:25 ON 24 OCT 2005  
  
FILE 'HCAPLUS' ENTERED AT 08:28:44 ON 24 OCT 2005  
E US 6531389/RE  
L2 2 SEA ABB=ON PLU=ON "US 6531389, 2003, SHUE"/RE  
  
FILE 'STNGUIDE' ENTERED AT 08:28:55 ON 24 OCT 2005  
  
FILE 'REGISTRY' ENTERED AT 08:30:03 ON 24 OCT 2005  
L3 3460 SEA ABB=ON PLU=ON N TA/ELF OR N.TA/MF OR N TI/ELF OR N.TI/MF  
  
L4 1 SEA ABB=ON PLU=ON TUNGSTEN/CN  
L5 1 SEA ABB=ON PLU=ON ALUMINUM/CN  
L6 1 SEA ABB=ON PLU=ON COPPER/CN  
  
FILE 'HCAPLUS' ENTERED AT 08:30:47 ON 24 OCT 2005  
L7 17 SEA ABB=ON PLU=ON (L1 OR L2)  
L8 8 SEA ABB=ON PLU=ON L7 AND L3  
L9 5 SEA ABB=ON PLU=ON L7 AND L4  
L10 0 SEA ABB=ON PLU=ON L7 AND L5  
L11 11 SEA ABB=ON PLU=ON L7 AND L6  
L12 9 SEA ABB=ON PLU=ON L11 AND (L8 OR L9)  
L13 0 SEA ABB=ON PLU=ON L12 AND (AL OR ALUMINUM OR ALUMINIUM)  
  
FILE 'REGISTRY' ENTERED AT 08:32:14 ON 24 OCT 2005  
L14 1019 SEA ABB=ON PLU=ON AL.CU/MF OR AL CU ELF  
L15 78010 SEA ABB=ON PLU=ON ALUMINUM ALLOY AND AL>50/MAC  
  
FILE 'HCAPLUS' ENTERED AT 08:33:17 ON 24 OCT 2005  
L16 1 SEA ABB=ON PLU=ON L12 AND L14  
L17 0 SEA ABB=ON PLU=ON L12 AND L15  
D L16 IBIB IAB HITSTR  
  
FILE 'STNGUIDE' ENTERED AT 08:34:49 ON 24 OCT 2005  
  
FILE 'STNGUIDE' ENTERED AT 08:35:55 ON 24 OCT 2005

=> log h

STIC-EIC2800 JEF-4B68

09/805,027

searched on 10/24/2005

Forward-Citation-Search

L16 ANSWER 1 OF 1 HCAPLUS COPYRIGHT 2005 ACS on STN

ACCESSION NUMBER: 2004:54272 HCAPLUS

DOCUMENT NUMBER: 140:103188

TITLE: Contact capping local interconnect for electronic devices

INVENTOR(S): Geffken, Robert M.; Horak, David V.; Stamper, Anthony

PATENT ASSIGNEE(S): International Business Machines Corporation, USA

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6680514	B1	20040120	US 2000-745047	20001220
US 2004021226	A1	20040205	US 2003-632653	20030802
US 6939791	B2	20050906		

PRIORITY APPLN. INFO.: US 2000-745047 A3 20001220

AB The present invention relates to a method and structure for forming a metallic capping interface between a damascene conductive wire/stud and a damascene conductive wiring level. The method forms a 1st insulative layer on a substrate layer, followed by forming damascene conductive wires/studs in the 1st insulative layer. A lower portion of each damascene conductive wire/stud is in contact with an electronic device (e.g., a field effect transistor), or a shallow trench isolation, that is within the substrate layer. A top portion of the 1st insulative layer is removed, such as by etching, such that an upper portion of the damascene conductive wires/studs remain above the 1st insulative layer. A metallic capping layer is formed on the upper portions of the damascene conductive wires/studs such that the metallic capping layer is in conductive contact with the damascene conductive wires/studs. Portions of the metallic capping layer between the damascene conductive wires/studs are removed to form a metallic cap on each damascene conductive wire/stud and to conductively isolate  $\geq 1$  of the damascene conductive wires/studs. A portion of the metallic capping layer may be removed from a particular damascene conductive wire/stud such that no metallic capping material remains conductively coupled to the particular damascene conductive wire/stud. A 2nd insulative layer is formed on the 1st insulative layer such that the 2nd insulative layer covers the metallic caps. Damascene conductive wiring lines are formed within the 2nd insulative layer above the metallic caps and are conductively coupled to the metallic caps.

IT 7440-33-7, Tungsten, uses 7440-50-8, Copper, uses

11099-19-7 12033-62-4, Tantalum nitride (TaN)

25583-20-4, Titanium nitride (TiN)

RL: DEV (Device component use); USES (Uses)

(cap layer; contact capping local interconnect for electronic devices)

RN 7440-33-7 HCAPLUS

CN Tungsten (8CI, 9CI) (CA INDEX NAME)

RN 7440-50-8 HCAPLUS

CN Copper (7CI, 8CI, 9CI) (CA INDEX NAME)

RN 11099-19-7 HCAPLUS

CN Aluminum alloy, nonbase, Al,Cu (9CI) (CA INDEX NAME)

RN 12033-62-4 HCAPLUS

CN Tantalum nitride (TaN) (6CI, 8CI, 9CI) (CA INDEX NAME)

RN 25583-20-4 HCAPLUS

CN Titanium nitride (TiN) (7CI, 8CI, 9CI) (CA INDEX NAME)

STIC-EIC2800 JEF-4B68

10/21/2005 09/805,027 Lewis

FILE 'REGISTRY' ENTERED AT 13:43:37 ON 20 OCT 2005

L1 3050 SEA ABB=ON PLU=ON N TI/ELF  
L2 147 SEA ABB=ON PLU=ON N.TA/MF  
L3 3050 SEA ABB=ON PLU=ON N TI/ELF  
L4 271 SEA ABB=ON PLU=ON N.TI/MF  
L5 1 SEA ABB=ON PLU=ON TUNGSTEN/CN  
L6 1 SEA ABB=ON PLU=ON COPPER/CN  
L7 1 SEA ABB=ON PLU=ON ALUMINUM/CN

FILE 'CAPLUS' ENTERED AT 13:47:40 ON 20 OCT 2005

FILE 'REGISTRY' ENTERED AT 13:48:50 ON 20 OCT 2005

L8 419 SEA ABB=ON PLU=ON N TA/ELF

FILE 'CAPLUS' ENTERED AT 13:49:49 ON 20 OCT 2005

L9 34009 SEA ABB=ON PLU=ON L1 OR L4  
L10 5779 SEA ABB=ON PLU=ON L2 OR L8  
L11 956210 SEA ABB=ON PLU=ON VIA OR STUD OR PLUG OR HOLE OR APERTURE OR  
RIE OR REACTIVE ION ETCHING OR DAMASCENE  
L12 3387342 SEA ABB=ON PLU=ON BARRIER OR LINER OR LINING OR LINE OR  
INTERLIN? OR INTERLAYER OR INLAY OR DEPOSI? OR ?FILL? OR  
?COAT? OR INSULATOR(W) FILM OR LAMINA?  
L13 1316827 SEA ABB=ON PLU=ON MULTI? OR BILAYER OR BI LAYER OR TRILAYER  
OR TRI LAYER OR (THIRD OR SECOND OR 2ND OR TWO OR 3RD OR THREE  
OR PAIR OR MANY OR SEVERAL OR DOUBLE OR DUAL) (3A) (LAYER OR  
FILM OR BARRIER)  
L14 10 SEA ABB=ON PLU=ON PVD (W) TUNGSTEN  
L15 73 SEA ABB=ON PLU=ON PVD (5A) TUNGSTEN  
L16 6319 SEA ABB=ON PLU=ON TANTALUM NITRIDE OR TA N OR TA NITRIDE  
L17 35384 SEA ABB=ON PLU=ON (TITANIUM OR TI) (W) NITRIDE OR TI (W) N  
L18 6317 SEA ABB=ON PLU=ON L16 NOT TAS  
L19 35326 SEA ABB=ON PLU=ON L17 NOT TIS  
L20 38803 SEA ABB=ON PLU=ON L9 OR L19  
L21 6999 SEA ABB=ON PLU=ON L10 OR L16  
L22 1594 SEA ABB=ON PLU=ON L6 AND L7 AND (L20 OR L21)  
L23 531 SEA ABB=ON PLU=ON L22 AND L11  
L24 182 SEA ABB=ON PLU=ON L23 AND L12 AND L13  
L25 722476 SEA ABB=ON PLU=ON IC OR INTEGRATED CIRCUIT OR CHIP OR  
MICROCHIP OR WAFER OR INTERCONNECT OR SEMICONDUCT?  
L26 166 SEA ABB=ON PLU=ON L24 AND L25  
L27 34871 SEA ABB=ON PLU=ON (?MIGRAT? OR ?DIFFUS?) (5A) (CU OR COPPER OR  
AL OR ALUMINUM OR ALUMINIUM)  
L28 16 SEA ABB=ON PLU=ON L26 AND L27  
D IBIB ABS HITSTR HITIND 1-16  
L29 125342 SEA ABB=ON PLU=ON (VIA/TI OR STUD/TI OR PLUG/TI OR HOLE/TI  
OR APERTURE/TI OR RIE/TI OR REACTIVE ION ETCHING/TI OR  
DAMASCENE/TI)  
L30 60 SEA ABB=ON PLU=ON (L26 AND L29) NOT L28  
L31 35 SEA ABB=ON PLU=ON L30 AND PY>2001  
L32 25 SEA ABB=ON PLU=ON L30 NOT L31  
D IBIB ABS HITSTR HITIND 1-25  
E BURRELL LLOYD/AU  
L33 8 SEA ABB=ON PLU=ON "BURRELL LLOYD G"/AU  
D IBIB ABS 1-8

EIC 2800 MARY S. MIMS 272-5928

10/21/2005 09/805,027 Lewis

E COONEY III EDWARD/AU  
E COONEY EDWARD/AU  
L34 5 SEA ABB=ON PLU=ON "COONEY EDWARD C III"/AU  
D IBIB ABS 1-5  
E GAMBINO JEFFREY/AU  
  
L35 78 SEA ABB=ON PLU=ON "GAMBINO JEFFREY P"/AU OR "GAMBINO JEFFREY  
PETER"/AU  
L36 67 SEA ABB=ON PLU=ON L35 AND L25  
L37 45 SEA ABB=ON PLU=ON L36 AND PY>2001  
L38 22 SEA ABB=ON PLU=ON L36 NOT L37  
D IBIB ABS 1-22  
E HEIDENREICH JOHN E III/AU  
L39 10 SEA ABB=ON PLU=ON "HEIDENREICH JOHN E III"/AU OR "HEIDENREICH  
JOHN EDWARD III"/AU OR "HEIDENREICH JOHN E"/AU  
D IBIB ABS 1-10  
E LEE HYUN KOO/AU  
L40 15 SEA ABB=ON PLU=ON "LEE HYUN KOO"/AU  
L41 6 SEA ABB=ON PLU=ON L40 AND PY>2001  
L42 9 SEA ABB=ON PLU=ON L40 NOT L41  
D IBIB ABS 1-9  
E LEVY MARK D/AU  
L43 4 SEA ABB=ON PLU=ON "LEVY MARK D"/AU  
D IBIB ABS  
D IBIB ABS 2-4  
E LI BAOZHEN/AU  
L44 40 SEA ABB=ON PLU=ON "LI BAOZHEN"/AU  
L45 12 SEA ABB=ON PLU=ON L44 AND L25  
D IBIB ABS 1-12  
E LUCE STEPHEN E/AU  
L46 10 SEA ABB=ON PLU=ON "LUCE STEPHEN E"/AU OR "LUCE STEPHEN  
ELLINWOOD"/AU  
L47 9 SEA ABB=ON PLU=ON L46 AND L25  
D IBIB ABS 1-9  
E MCDEVITT THOMAS L/AU  
L48 14 SEA ABB=ON PLU=ON "MCDEVITT THOMAS L"/AU OR "MCDEVITT THOMAS  
LEDDY"/AU  
L49 10 SEA ABB=ON PLU=ON L48 AND L25  
D IBIB ABS 1-10  
L50 49 SEA ABB=ON PLU=ON STAMPER ANTHONY K/AU  
E STAMPER ANTHONY K/AU  
  
L51 14 SEA ABB=ON PLU=ON "STAMPER ANTHONY"/AU OR "STAMPER ANTHONY  
KENDALL"/AU  
L52 63 SEA ABB=ON PLU=ON L50 OR L51  
L53 58 SEA ABB=ON PLU=ON L52 AND L25  
L54 47 SEA ABB=ON PLU=ON L53 AND PY>2001  
L55 11 SEA ABB=ON PLU=ON L53 NOT L54  
D IBIB ABS 1-11  
E WONG KWONG HON/AU  
L56 44 SEA ABB=ON PLU=ON "WONG KWONG H"/AU OR "WONG KWONG HON"/AU  
L57 34 SEA ABB=ON PLU=ON L56 AND L25  
L58 31 SEA ABB=ON PLU=ON L57 AND PY>2001  
L59 3 SEA ABB=ON PLU=ON L57 NOT L58  
D IBIB ABS 1-3  
E YANKEE SALLY J/AU  
L60 5 SEA ABB=ON PLU=ON "YANKEE SALLY J"/AU  
D IBIB ABS 1-5

EIC 2800 MARY S. MIMS 272-5928

10/24/2005 09/805027 Lewis

File 2:INSPEC 1969-2005/Oct W3  
(c) 2005 Institution of Electrical Engineers

Set	Items	Description
S1	31735	CI=CU INT
S2	76129	CI=AL INT
S3	266	CI=(TI SS(S)N SS(S)W)
S4	69	CI=(TA SS(S)N SS(S)W)
S5	6678	CI=W INT
S6	22	CI=TIN SS
S7	2	CI=TAN SS
S8	7120	CI=(TI BIN(S)N BIN)
S9	1025	CI=(TA BIN(S)N BIN)
S10	7140	S6 OR S8
S11	1027	S7 OR S9
S12	4693	S1 AND S2
S13	60	S12 AND S5 AND S10
S14	2	S12 AND S5 AND S11
S15	40	S13 AND (VIA? ? OR STUD? ? OR PLUG? ? OR HOLE? ? OR APERTU- RE? ?
S16	3	S12 AND (S3 OR S4)
S17	3	S16 NOT S15

? logoff hold

25oct05 11:56:43 User259284 Session D3376.2

**File 2:INSPEC 1898-2005/Oct W3**  
**(c) 2005 Institution of Electrical Engineers**

Set	Items	Description
S1	841	CI=TAN
S2	6874	CI=TIN
S3	11512	CI=W EL
S4	7120	CI=(TI BIN(S)N BIN)
S5	565	CI=(TI SS(S)N SS) (S)NE=2
S6	2716	CI=(TI SS(S)N SS) (S)NE=3
S7	453	CI=(TA SS(S)N SS) (S)NE=3
S8	99	CI=(TA SS(S)N SS) (S)NE=2
S9	1025	CI=(TA BIN(S)N BIN)
S10	603	CI=CUAL
S11	2080	CI=ALCU
S12	39103	CI=AL EL
S13	44045	CI=CU EL
S14	21238	S1:S8
S15	220	S10:S11 AND S14
S16	1454	S12 AND S14
S17	1990	S13 AND S14
S18	343	16AND17
S19	66	S18 AND (AL OR ALUMINUM OR ALUMINIUM) (6N) (FILM? ? OR LAYER? ? OR DEPOSIT?????)
S20	66	S18 AND (CU OR COPPER) (6N) (FILM? ? OR LAYER? ? OR DEPOSIT?- ????)
S21	48	19AND20
S22	1915	(TAN OR TANTALUM OR NITRIDE?? OR TITANIUM OR TUNGSTEN OR W- ) (7N)BARRIER??
S23	5479	(CU OR COPPER OR AL OR ALUMINUM OR ALUMINIUM) (7N)BARRIER??
S24	13717	(CU OR COPPER OR AL OR ALUMINUM OR ALUMINIUM) (7N) (MIGRAT??- ??? OR DIFFUS???? OR ELECTROMIGRAT?????? OR ELECTRODIFFUS????- ?)
S25	11	21AND22
S26	18	21AND23
S27	15	21AND24
S28	746	S22 AND S23:S24
S29	10	S25:S27 AND S28
S30	2067	S19:S24 AND INTERCONNECT?
S31	619	S19:S24 AND PATTERN?
S32	156	30AND31
S33	208	(S15 OR S18) AND INTERCONNECT?
S34	33	(S15 OR S18) AND PATTERN?
S35	16	33AND34
S36	63	S21 OR S35
S37	53	S36 NOT S29
S38	20	S37 AND LAYERS/AB
S39	2	S37 AND (UNDERLAYER? OR SUBLAYER?)/AB
S40	2	S37 AND OVERLAYER?/AB
S41	0	S37 AND DOUBLE() LAYER?????
S42	22	S38:S40 NOT S29